Memorandum

To: *Diane Salkie, EPA Region 2*
Elizabeth Franklin, USACE

From: *Troy Gallagher, CDM Smith*

Date: *December 11, 2019*

Subject: *Summary of Oversight of Chemical Water Column Monitoring*
September 16–17, 2019
Lower Passaic River Restoration Project

On behalf of the United States Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE), Kansas City District, CDM Federal Programs Corporation (CDM Smith) traveled to the Lower Passaic River Study Area (LPRSA) on Monday, September 16 through Tuesday, September 17, 2019 and provided field technical oversight for the third round of surface water sampling associated with the Chemical Water Column Monitoring (CWCM) program.

Water sampling was conducted at 5 different locations along the Lower Passaic River at the following river mile (RM) locations: RM 8.4, RM 10.2, RM 12.0, RM 13.5, and RM 15.8. Only one sample was collected from RM 15.8 from a mid-depth of the river. For the remaining four locations, two samples were collected from each location, one from the top of the RM location approximately 3 feet below the surface, and the second from the bottom, approximately 2 feet above the river bottom; samples were collected during both flood and ebb tides from each river mile station. Samples were collected using a peristaltic pump to pump water directly into the sample containers. Water quality parameters were recorded at the time of sampling for each location, and a vertical profile was performed before and after samples were collected. Field activities were conducted by Ocean Surveys, Inc. (OSI) and AECOM on behalf of the Cooperating Parties Group (CPG). Anchor QEA provided field support on behalf of the CPG. Split samples were collected by CDM Smith on September 17, 2019.

The fixed point monitoring locations are presented in Figure 1 from the CPG's quality assurance project plan (QAPP). Oversight was conducted in accordance with CDM Smith's Final QAPP for CWCM, dated September 3, 2019. Photographs of field activities are presented in Attachment 1. A copy of the field logbook notes is provided in Attachment 2. A copy of the sample tracking log is provided in Attachment 3.

Summary of Monday, September 16, 2019 Field Activities

Personnel in Attendance

Troy Gallagher – CDM Smith
Alexandra Allen – OSI
James Roth – AECOM
Clare Murphy-Hagan – AECOM
Mike Tatarelli – AECOM

All personnel met at the 1 Madison Street boat dock in Rutherford, New Jersey. OSI and AECOM rode in OSI's boat, which was equipped with equipment for sampling. Only one boat was present for the field work performed on this day, no representation was provided by Anchor QEA, therefore CDM Smith personnel was aboard the OSI vessel for the sampling activities.

All personnel mobilized to RM 13.5 to begin collecting the samples during the flood tide. Upon arrival to RM 13.5, YSI water quality parameters were recorded by AECOM personnel, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was taken before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of RM 13.5. After all sample containers were filled, the YSI was raised and the tubing was replaced to begin collection from the top of the river. The water quality parameters were recorded, and then the sample collection began. A vertical profile of water quality parameters was collected after sample collection to complete sampling activities at this location. All samples collected during this flood tide sampling were brought to the Madison Street dock to be delivered to AECOM personnel on shore.

All personnel mobilized to RM 12.0 to begin collecting the samples during the flood tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 12.0 location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. During the collection of samples from the surface at RM 12.0, connection with the YSI from the boat computer was lost; connection was lost for about the last 5 minutes of sample collection. Clare Murphy-Hagan called Kristen Durocher (AECOM) to determine what the best course of action would be. It was determined that enough data had been collected during the sample collection before the connection was lost, so the samples would not have to be recollected. During the collection of the final water quality parameters, the data was observed to make sure that it had not changed from the beginning of sample collection, which it had not. The final vertical profile of water quality parameters was collected, and the boat headed back to the Madison Street dock to wait for the ebb tide sampling.

The crew waited on shore until the tide in the river changed so the collection of the ebb tide samples could begin. Once the ebb tide had begun, the OSI boat mobilized to RM 15.8 to begin preparations for sampling. OSI collected a vertical profile of water quality parameters and AECOM recorded the water quality parameters and labeled bottleware. Samples were collected from a mid-depth point at RM 15.8 during the ebb tide. A final vertical profile of water quality parameters was collected. The boat departed RM 15.8 to perform ebb tide sampling at RM 13.5

All personnel mobilized to RM 13.5 to begin collecting the samples during the ebb tide. OSI collected a vertical profile of water quality parameters and AECOM recorded water quality parameters and labeled bottleware. Samples were collected from the bottom of RM 13.5 during the ebb tide, after which the YSI was raised to the surface, and the tubing was replaced. Water quality parameters were recorded, and the samples were collected from the surface of RM 13.5. A final vertical profile of water quality parameters was collected and concluded the activities at this location. The OSI boat departed from RM 13.5 to collect the final samples of the day at RM 12.0.

All personnel mobilized to RM 12.0 to begin collecting the samples during the ebb tide. OSI collected a vertical profile of water quality parameters and AECOM recorded water quality parameters and labeled bottleware. Samples were collected from the bottom of RM 12.0 during the ebb tide, after which the YSI was raised to the surface, and the tubing was replaced. Water quality parameters were recorded, and the samples were collected from the surface of RM 12.0. A final vertical profile of water quality parameters was collected and concluded the activities for this day of chemical water sampling. The boat returned to the 1 Madison Street dock to unload coolers and prepare coolers for shipment.

Summary of Tuesday, September 17, 2019 Field Activities

Personnel in Attendance

Troy Gallagher – CDM Smith
Alexandra Allen – OSI
James Roth – OSI
Clare Murphy-Hagan – AECOM
Mike Tatarelli – AECOM
Chris Pelrah – Anchor QEA

All personnel met at the 1 Madison Street boat dock in Rutherford, New Jersey. OSI and AECOM rode in OSI's boat, which was equipped with equipment for sampling. Anchor QEA and CDM Smith rode in a support boat for observation and oversight.

All personnel mobilized to RM 10.2 to begin collecting the samples during the flood tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 10.2

location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. The water quality parameters were recorded, and then the sample collection began. A final vertical profile of water quality parameters was collected to finish up sampling activities at RM 10.2. AECOM collected a field duplicate sample at this location.

All personnel mobilized to RM 8.4 to begin collecting the samples during the flood tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 8.4 location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. The water quality parameters were recorded, and then the sample collection began. A final vertical profile of water quality parameters was collected to finish up sampling activities at RM 8.4. Both boats mobilized back to the Madison Street dock to await the ebb tide.

All personnel mobilized to RM 10.2 to begin collecting the samples during the ebb tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 10.2 location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. The water quality parameters were recorded, and then the sample collection began. CDM Smith collected a split sample from the surface of RM 10.2, including a field duplicate. AECOM alternated filling their bottles and filling the CDM Smith bottles to make sure both samples were representative of the sample location. The split sample was collected with the sample identification of 19P-CE04-T102-AS-CDM and 19P-CE04-T102-AS-CDM-100 for the sample and the duplicate, respectively. A final vertical profile of water quality parameters was collected to finish up sampling activities at RM 10.2.

All personnel mobilized to RM 8.4 to begin collecting the samples during the ebb tide. AECOM recorded water quality parameters from the YSI, and sample containers were labeled to prepare for collection. A vertical profile of water quality parameters was collected before sample collection as well. The peristaltic pump was turned on, and sample collection began from the bottom of the RM 8.4 location. After all sample containers were filled, the YSI was raised and tubing was replaced to begin collection from the top of the river. The water quality parameters were recorded, and then the sample collection began. A final vertical profile of water quality parameters was collected to finish up sampling activities at RM 8.4. Both boats mobilize back to the Madison Street dock to conclude the sampling activities for the day.

After arriving back on shore, Troy Gallagher packed all of the split sample containers in coolers and prepared them for shipment through FedEx. Surface water samples were sent to SGS AXYS laboratory to be analyzed for pesticides, PCBs, PAHs, and dioxin/furans; Katahdin Analytical Services was sent surface

water samples to be analyzed for TOC, POC, TSS, total and dissolved metals, and total and dissolved mercury. Four coolers were dropped off at FedEx for overnight delivery.

Figure 1

Attachment 1

Photographs of Field Activities

Photograph 1: AECOM pumping water through the peristaltic pump at RM 13.5.

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Photograph 2: OSI performing vertical profile and AECOM preparing bottleware for sampling.

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Photograph 3 AECOM filling sample bottles at RM 10.2.

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Photograph 4: AECOM labelling and filling sample bottles at RM 10.2

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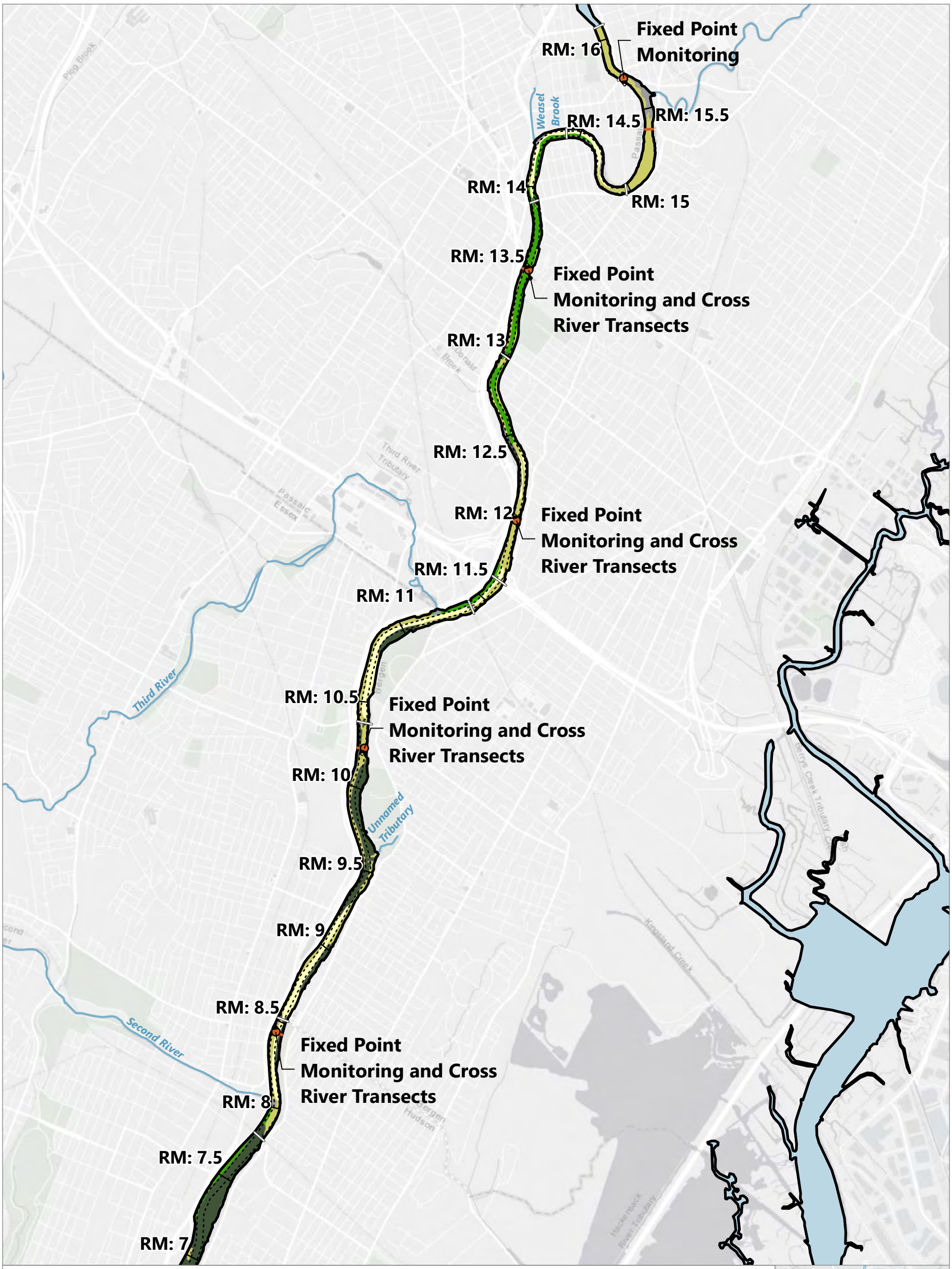
Attachment 2

Field Logbook

Attachment 3

Sample Tracking Log



Publish Date: 2019/05/21, 10:59 AM | User: dbaker
Filepath: \\Boston1\jobs\Passaic_CPG\DOCUMENTS\2019\Current_Conditions_Physical_WC_QAPP\source\RM7.8_to_DD_Map_monitoring_locations_FullExtent.mxd

Figure 1
Current Conditions Monitoring Locations
Field Sampling Plan Addendum
Current Conditions Monitoring Program - Physical Water Column Monitoring
Lower Passaic River Restoration Project

Location: Rutherford NJ Date: 9/16/19

Project / Client: LPR / USACE

Diamond Alkali OU4 / CWCM (19P)

05^{30} TG arrive onsite at 1 Madison

Weather: 72°F, raining

PPE: Level D, PFD

Purpose: Oversight of CWCM sampling

05^{45} Meet with Alex from OSI to discuss plan for today. Waiting for AECOM crew to arrive at dock. Also speak with Clare Murphy-Hagan and Mike Tatarelli (AECOM) about which day/location would be best to take our splits from. Splits will be collected tomorrow.

06^{05} All crew members meet on the dock before departure for H+S meeting: boat safety and drink lots of water.

06^{20} Depart dock, head for RM 13.5, first sampling of day. On boat is Alex + James (OSI), Clare + Mike (AECOM) + TG.

06^{27} Arrive at RM 13.5. Begin labeling bottles and getting YSI ready for deployment.

06^{35} Vertical profile completed, water quality parameters collected

Location: Rutherford NJ Date: 9/16/19

Project / Client: LPR / USACE

Diamond Alkali OU4 / CWCM

06^{45} Samples collected from RM 13.5, flood tide, from the bottom. Water quality parameters collected after samples were collected.

06^{55} Raise YSI and change tubing.

07^{05} Samples collected from surface at RM 13.5, flood tide. Water quality parameters collected before and after sample collection.

07^{20} Final vertical profile completed. Head back to dock to swap coolers.

07^{45} Arrive at RM 12.0. AECOM prepares bottles for sampling while OSI prepares YSI for profiling.

07^{55} Vertical profile completed. Water quality parameters collected.

08^{00} Samples collected from RM 12.0, flood tide, from bottom. Water quality parameters collected after sample collection. Raise YSI + change tubing.

08^{15} Deploy YSI and collect water quality parameters.

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Location Rutherford NJ Date 9/16/19

Project / Client LPR / USACE

Diamond Alkali OU4 / CWCM

0825 Samples collected from RM 12.0, flood tide, surface. Water quality parameters collected before and after sample collection.

0840 During sample collection, connection with YSI was lost, ending the live collection of water quality parameters. Clare asks Kristen Durocher (AECOM) what she recommends. Kristen says it's fine, as enough data was collected. Final vertical profile collected from RM 12.0. Crew heads back to 1 Madison St. dock to wait for ebb tide to begin.

0900 Back at dock.

1130 TG back onsite, waiting for rest of crew members to arrive. Meet crew on dock and prepare to head out for ebb tide sampling. On board oversight boat with Chris Pelrah (AQEA) for afternoon sampling.

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Location Rutherford NJ Date 9/16/19

Project / Client LPR / USACE

Diamond Alkali OU4 / CWCM

1200 Depart dock and head upstream to RM 15.8 to collect sample.

1220 Arrive at RM 15.8. AECOM starts labeling bottles and OSI preps YSI. AQEA boat ties up to OSI boat to watch sampling.

1240 Vertical profile collected, as well as WQ parameters.

1250 Samples collected from mid-point depth @ RM 15.8, ebb tide. WQ parameters collected after sample collection. Final vertical profile completed. Crew departs and heads downstream to next location.

1320 Arrive @ RM 13.5. Vertical profile taken, WQ parameters also taken.

1335 Samples collected from bottom at RM 13.5, ebb tide. WQ parameters taken after collection.

1345 YSI raised and tubing changed, WQ parameters collected.

1355 Samples collected from surface @ RM 13.5, ebb tide.

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Location Rutherford NJ Date 9/16/19

Project / Client LPR / USACE

Diamond Alkali OU4 / CWCM

14^{08} Final WQ parameters + vertical profile collected. Crew heads down to RM 12.0

14^{20} Arrive at RM 12.0. OSI + AECOM prepare for sampling efforts.

14^{30} Vertical profile collected. WQ parameters taken

14^{45} Samples collected from bottom at RM 12.0, ebb tide. WQ parameters taken. YSI raised and tubing replaced.

15^{05} Samples collected from the surface at RM 12.0, ebb tide. WQ parameters taken both before and after sample collection.

15^{15} Final vertical profile taken, both boats head back to dock

15^{45} TG offsite

AF 9/16/19

Location RutherFord NJ Date 9/17/19

Project / Client LPR / USACE

Diamond Alkali OU4 / CWCM

06^{00} TG arrive onsite.

Weather: 70°F, overcast.

PPE: Level D

Purpose: Oversight of CWCM sampling event as well as collection of a split sample.

06^{15} Meet OSI on dock, load up boat with equipment. CDM split sample will be collected in the afternoon during ebb. On site is Alex Allen + James Roth (OSI), Clare Murphy-Hagan + Mike Tatarelli (AECOM), Chris Pelrah (AQEA) and TG (CDM).

06^{35} H+S meeting. Both boats head to RM 10.2 for first sample.

07^{10} Arrive @ RM 10.2. OSI prepares YSI, and AECOM labels bottles

07^{15} Vertical profile completed

07^{20} Begin collecting samples from bottom @ RM 10.2, flood tide, duplicate sample also collected.

07^{45} Raise YSI and replace tubing.

AF 9/17/19

Location Rutherford NJ Date 9/17/19

Project / Client LPR / USACE

Diamond alkali 044 / CWCM

0800 Begins collecting samples from top of RM 10.2, flood tide. Final vertical profile completed Crew heads to RM 8.4

0830 Arrive @ RM 8.4, preparing for sampling. Vertical profile performed.

0845 Samples collected from bottom of RM 8.4, flood tide. Raise YSI and replace tubing.

0910 Samples collected from surface @ RM 8.4, flood tide. Final vertical profile collected. Looking for salt front @ 2.2 ppt for tomorrow's event.

1000 Head back to dock.

1100 Crew back at dock. TG begins printing out sample labels and shipping information. Labels bottles before crew goes out for next tide sampling.

1215 Mobilizing on dock, loading coolers onto boats. TG recieves extra sample containers from Sarah Cascarino.

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Location Rutherford NJ Date 9/17/19

Project / Client LPR / USACE

Diamond alkali 044 / CWCM

1250 Arrive @ RM 10.2. CDM Smith split sample will be taken from the surface at this location.

1315 Vertical profile collected.

1320 Samples collected from bottom of RM 10.2, ebb tide. YSI raised to surface and tubing changed.

1340 Samples collected from surface @ RM 10.2, ebb tide. CDM splits taken. 19P-CE04-T102-AS-CDM + 19P-CE04-T102-AS-CDM-100,

1415 Final vertical profile taken. Crew moves to RM 8.4.

1430 Arrive @ RM 8.4 and begin sample preparations. Vertical profile taken

1440 Samples collected from the bottom of RM 8.4, ebb tide. YSI raised and tubing replaced.

1500 Samples collected from the surface @ RM 8.4, ebb tide. ~~Crew to~~. Final vertical profile taken, crew heads back to dock.

1555 Back @ dock. TG buys ice and starts preparing coolers for shipment.

9/17/19

Rite in the Rain

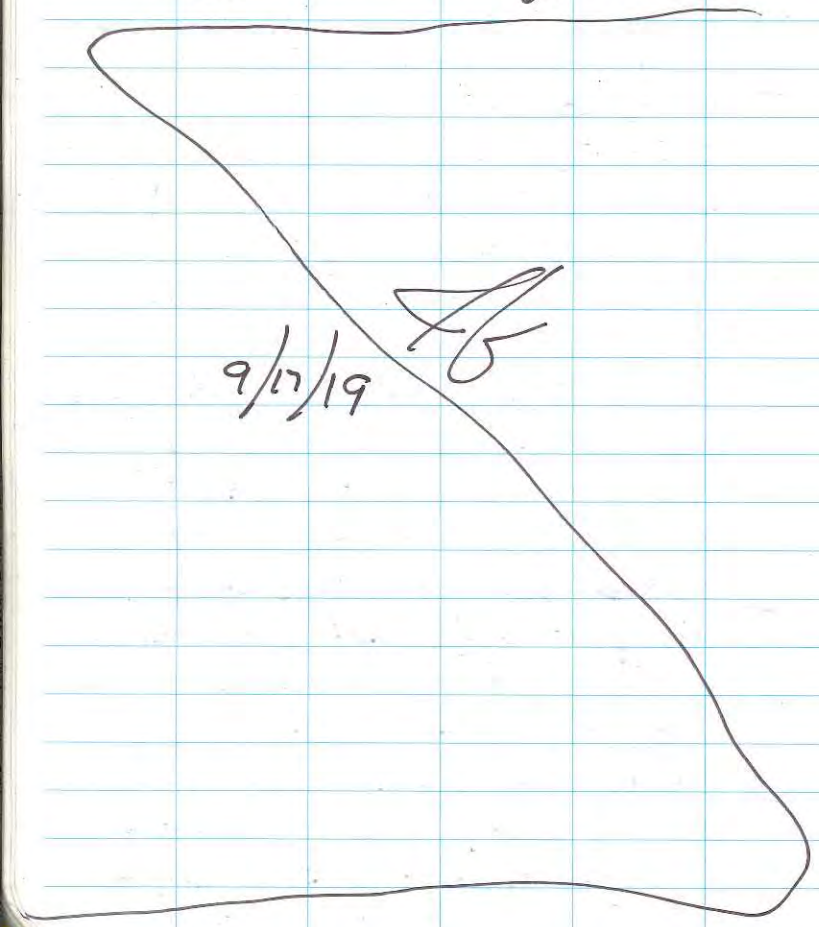
Location Rutherford NJ Date 9/17/19

Project / Client LPR / USACE

Diamond alkali OU4 / EWCM

1700 AECOM crew offsite. TG finishing up packing coolers.

1745 TG drops two coolers to Katahdin + two coolers to AXYS. @ FedEx. Offsite



Location Rutherford NJ Date 9/18/19

Project / Client LPR / USACE

Diamond alkali OU4 / PWCM

0530 TG arrives onsite

Weather: 65°F, partly cloudy

PPE: Level D, PFD

Purpose: Oversight of PWCM sampling

0600 Meet on dock with Alex, James, Chris, Mike, and Clare. H+S meeting delivered. Will head downstream to find the salt front.

0620 Depart from dock downstream

0720 Salinity of 2.2ppt found right by channel buoy 12, south of RR bridge. Heading 1.5 miles upstream to check salinity

0740 Preparing tubing and YSI. Getting ready to sample first location. Vertical profile completed.

0745 Samples collected from top + bottom @ 1.5 miles upstream from 2.2ppt salt front, flood tide.

0755 Vertical profile taken @ 0.25 miles downstream from first sampling location.

9/18/19

CWCM #3

Cidra Groundwater Contamination Site
SAMPLE TRACKING LOG

Trace VOC LAB: _____ INORGANIC CLP LAB: _____

CLP CASE NO: _____ ORGANIC CLP LAB: _____ SUBCONTRACT LAB: SGS AXYS

SAMPLE ID	SAMPLE DATE	SAMPLE TIME	MATRIX	DEPTH (feet)	Trace VOC CLP NO.	ORGANIC CLP NO.	INORGANIC CLP NO.	SUBCONTRACT ANALYSIS	QA/QC
19P-CE04-T120-AS-CDM	9/17/19	1340	SW	A	—	—	—	D/F, PCBs, Pest, PAH	MS/MSD
19P-CE04-T120-AS-CDM-100	9/17/19	1340	SW	A	—	—	—	↓	Duplicate

ANALYSIS SUMMARY: D/F - Dioxin/Furans, PCBs - polychlorinated biphenyls, Pest - organochlorine pesticides, PAH - polycyclic aromatic hydrocarbons

CWCM #3

Cidra Groundwater Contamination Site
SAMPLE TRACKING LOG

Trace VOC LAB: _____ **INORGANIC CLP LAB:** _____

CLP CASE NO: _____ **ORGANIC CLP LAB:** _____ **SUBCONTRACT LAB:** Katahdin

SAMPLE ID	SAMPLE DATE	SAMPLE TIME	MATRIX	DEPTH (feet)	Trace VOC CLP NO.	ORGANIC CLP NO.	INORGANIC CLP NO.	SUBCONTRACT ANALYSIS	QA/QC
19P-CE04-T120-AS-CDM	9/17/19	1340	SW	A	-	-	-	SSC, POC/DOC, TAL Metals, Total Hg	MS/MSD
19P-CE04-T120-AS-CDM-100	9/17/19	1340	SW	A	-	-	-	↓	Duplicate

ANALYSIS SUMMARY: SSC - suspended solid concentration POC/DOC - particulate organic carbon / dissolved organic carbon (1 jar), TAL Metals - total + dissolved metals, Total Hg - total + dissolved Hg